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the composition for which is exactly the same, and to be boiled the same time as directed in the skimming coat, and when done the sand is to be put in and mixed well up with the server; put in the sand plentifully for you can scarcely put in too much; mix all well up; when done draw the fire, leaving only as much as will warm the servers and pots (*for carrying it up to the roof*) your trowels must be quite warm or the stuff will not spread; it must be spread half an inch thick, taking care to smooth the joinings well down, so as to make them disappear, which can only be done with a hot trowel; a small fire should be put under the boiler at first to keep the servers warm for mixing *the* chalk and tar.

Observations...The person alluded to, by Mr. Bevans, as having instructed Mr. Gillmore, in making the composition, is (we have reason to suppose from a letter received on the subject) Mr. Neilson; who has been "for the last four years in the employment of Edward Jones Agnew esq. of Kilwaughter, managing and superintending his buildings."

As it appears from the last mentioned letter, that some mistakes have arisen relative to a paper in No. 19 on the same subject, it is thought proper to state that its insertion did not originate from any application of Mr. Gillmore, that the gentleman who wrote it had no acquaintance with him, and merely mentioned his name as an attentive workman, who had executed the work mentioned in a substantial and satisfactory manner; that the information was procured at his desire by a friend of his, from Mr. Gillmore; and that had the names or the works of other persons who were equally well acquainted with the composition, been known at the time, they would have been as willingly mentioned as his, and that the *only motive* which the writer had for the publication, was the service of the public, in conveying to them useful information on such subjects; which it is part of his business to do, having undertaken to prepare the head of discoveries and improvements in arts, manufactures, &c. for this magazine; which head he has compiled, and furnished the remarks for since last August. Steps were taken shortly after the publication of No. 19, to procure information from Mr. Bevans on the subject by the intervention of a friend of his, as soon as it was *known* that he was concerned in the introduction of the composition into Ireland, and if this information could have been got sooner it would have been inserted before this.

It is hoped this plain statement of facts, will prevent in future the person who sent the letter alluded to, from mistaking his own conjectures for proofs, and induce him to make some inquiries as to the circumstances he thinks fit to descant on, before he again attributes to the writers for this work, motives for their publications, which never even were subjects of their imagination.

Method of constructing houses with earthen walls by Mr. Robert Salmon of Woburn.

Trans. Soc. Arts, v.27.

This method is that which has long been practised in France, under the denomination of *pise* building: in it earth is rammed in between molds, as shall be described, to form the walls, and the molds are withdrawn and elevated to form new portions of it till the whole is completed. Mr. Salmon's improvements on the French plan, consist principally in using iron bolts for connecting the sides of the molds, instead of wooden ones, and in fastening them with iron keys, instead of with ropes drawn tight by twisting them with levers.

The sides of Mr. Salmon's mold, consist each of leaves twelve feet long, twenty inches broad, and one inch thick, the boards of which are grooved and tongued together, and are connected and strengthened by several pieces of wood nailed across them. Holes are made through these pieces of wood, at top and bottom (guarded by iron plates to prevent them from wearing) to receive iron bolts, which hold the two frames parallel to each other, fourteen or sixteen inches asunder, which is the thickness of the wall intended to be formed between them. The bolts have each a large head at one end, and a key passes through the other, to keep the frames together: two boards of the breadth of the thickness of the wall, are placed between the frames at the ends, to form the extremities of the mold; these boards are placed between two bolts, which come close to them, at top and bottom.

When a wall is to be built, the foundation is laid in brick work or stone, and carried up about nine inches above the ground, and upon this the frames are placed, and bolted together. When the mold is filled with earth, and well rammed down, the keys are to be taken out of the bolts, and the bolts drawn out: the frames are then to be removed, and put together again, a length farther upon the wall, the bolts at the end being put through the holes left in the wall, only one of the end boards is now put in, and the ramming proceeds as before. In this manner straight walls may be built of any length, and when the lower course is finished, then the mold may be taken to pieces, and be put together again upon that course; the lower bolts of the frame being put through the bolt holes, which the upper bolts made in the wall, in the first operation, to insure the upper part of the wall being exactly over the lower. When a wall is built thinner than usual, a block of wood must be placed before the head of each bolt, so as to diminish the space between the planks.

When the angle walls of a building are to be made, four of the frames are to be put together so as to form a right angled mold. One end of each frame is furnished with double bolts (as before described) the other end of each has two eye-bolts fixed into it; then a bolt connects the two molds, so as to form a hinge; the frames are kept together so as to be perpendicular to each other, by a long iron rod hooked into eye-bolts fixed in frames. The outside frames of the mold are joined together in a different manner, one of them is longer than the other, and has two pair of holes made through its end to receive bolts, which are fastened to the ends of the shorter frames, and the keys are put through the ends of the bolts to secure the planks together. A piece of wood is occasionally put between the end of the short frame and the side of the other, to increase the space between the planks, to make a thicker wall, the two bolts at the end of the plank being received into notches in the piece of wood, and these bolts are then put through the holes prepared for them in the long frames. In building the angle walls, it is necessary that the vertical joints formed between each mold, should not be over one another, but arranged in the same manner as the joints of brickwork; this is accomplished by making the lower course of wall upon the brickwork only half the length of the mold; which is done by placing the end board of the mold in the middle of it. The next course over this is to be made the whole length of the mold, the ensuing one only half, and so on till the whole is finished.

Pieces of wood 1½ inch square, and the length of the thickness of the wall, are placed across over the upper bolts to keep the frames apart; in the first course they are used at the lower bolts also, but after this is finished they are only necessary at the upper ones.

When one course is carried round the building it frequently happens that the top becomes too dry to attach the succeeding course, and therefore it is adviseable, that as soon as the frame is set for the succeeding course, a small quantity of thick grout, composed of one-sixth lime, and four-fifths earth, be poured on the top of each course immediately before the first layer of earth is put in. A very small quantity is sufficient and will add much to the strength of the work, by cementing the courses well together at the joints. The workman should also, with the corner of the rammer, in ramming home to the upright joints, cut down a little of that part of the wall up to which he works; this will make the upright joints key together, and unite in a solid manner.

The earth proper for this work, should be a due mixture of sand and clay. Clay by itself is particularly objectionable, as is also chalk, or calcareous earth of any sort. The coarser the earth is the better. When used it should retain no more moisture than just to make it adhere together, under the pressure of the fingers. Those earths which abound with a mixture of grit or fine gravel are generally the best; as much earth should be put in each layer as to form about an inch and a half when compressed by ramming.

The rammer should not be more than half an inch wide at the edge, in order that it may more forcibly compress every part of the earth, which a flat rammer would not do so well.

In making the walls, about three inches in thickness of loose earth should be put in each course, which done, the same by means of a trowel made for the purpose, is drawn back and cleared from the face of the wall, and the space is then filled up with the facing composition, forming on an average about one inch in thickness. The common facing stuff is composed of lime one part, and earth, the same sort as used for walling, three parts. The lime and earth mixed and slacked together the same as for mortar. The more it is slacked and wetted the better, provided time can be allowed for it again to dry and pulverise, so as to be fit for ramming. The better sort of facing stuff may have a small quantity more lime in it.

The proper season for this work is when the earth can be got sufficiently dry for the purpose; the more early in the year the better, in order to give it time to dry before finishing; or if late it would be adviseable not to finish till the year after it is built.

Windows and doors may be left in the walls wherever wanted, by fixing the head of the mold and carrying up quoins to form them: in erecting which some bond timbers should be laid in coarse mortar, and rammed in with the earth. Lintels may also be laid at the proper height. But if many windows and doors of a siz are wanted, it will be best to make some frames of rough boards, of width equal to the thickness of the walls, to be placed in the situation of the windows and doors. When done the earth is rammed up to them, laying lintels over them, and bond timber at the sides, which should be as thin as possible to prevent chasms between the earth and timber, in their drying and shrinking. The bond timber may be about 4 inches by 1½ in thickness, floor or wall plates 6 inches by 2; and lintels about 4 inches thick; any slabs or rough stuff may be used, the earth being sure to ram close to it, and keep it in its place.

For common cottages, when the walls are up and covered in, the holes should be stopped with very coarse mortar, made the same as the facing stuff, but wetter, and the wall then be lime washed over with lime, and sharp sand, which should be made up in small quantities, and used while hot; which may be done by adding a knob of lime to sand a little at a time as it is used.

For better sort of cottages, the better kind of facing stuff may be used, and then the whole may be lime whited as before mentioned.—But if it be required to make the finishing as perfect as possible, the following is the best mode: with water and a brush thoroughly wet and soak the face of the wall, for two or three yards in superficies at a time; all wh ch part during the wetting should be rubbed and worked about with a hand float, till the face is rubbed smooth and even; by which the facing composition will form a pleasant and regular colour, and the face become smooth and hard when dry, and not liable to scale off as a coat of plaister would do. This finishing will be still improved by a small quantity of lime being put into the water which is used for soaking the face: and if after the wall is well soaked and rubbed, there be thrown on it with a brush some lime and sand (such as is used for lime whiting) and this also be worked into the face: the surface will then become as perfect and hard as stucco.

Several walls have been made at Woburn, with the above frames in the way described, under the direction of Mr. Salmon; and his own house also was built in this manner about twelve years ago, which is as close, warm and dry in the walls, as if built of brick.

Mr. Salmon computes the expense of a superficial yard of this walling at Woburn, where labour is 1s. 10d. per day, as follows.

	s.	d.
Labour in making compositions, ramming, &c.	2	2
Lime used in the composition, at 8d. per bushel, . . .		3
Lime and labour in rubbing and finishing the surface, . .		3
	2	8
If the wall is to be finished at both sides, add . . .		8.
Total for walls finished at both sides.	3	4

The great impediment to this work, is the difficulty of getting proper earth for it, as it is not to be found in all places; it is therefore best to make an experiment on a small piece, in any situation, and let it stand only covered at the top, for a winter at least, before more be done.

Care must be taken that the work be well rammed, as if the work is done by task it will be the interest of the labourer to do it slightly, and its perfection depends in a great measure on attention to this point.

Models of the frames and utensils used in making these earthen walls, are deposited at the house of the Society of Arts in London, together with a working drawing, on a scale of an inch to a foot, for the inspection of any person inclined to build in this manner.

The society voted Mr. Salmon a premium of twenty guineas for this communication.

Observations...It is supposed that this method of building would succeed very well in Ireland, as there are few places in it where proper earth for the purpose cannot be procured, as is proved by the frequency of common earthen walls in most districts. Some London writers have indeed gone so far as to imply that earthen cottages were peculiar to Ireland, but it is well known that they are full as common in Wales, Cornwall, and Devonshire, in which last county they are used for buildings two stories high, and for garden walls; that they are also common on the Continent, appears from the mode of building which is the subject of this paper, having been introduced into England from France, where it has been practised from a very remote period.

The method of building in frames or molds has not been always confined to the formation of earthen walls; it was formerly practised by the Romans in raising walls of small stones; and the existence of the ruins of some of these buildings to this day, is a sufficient proof of the excellence and durability of the method. The frames and molds used for this purpose were probably of the same nature as those described; and the method which they used in building (as appears from the remains of walls built in this manner) was, after fixing the molds in their proper position, to pack small stones in them in regular courses as close as possible, and then to fill up all the interstices with a fluid composition of hot lime, sand and water, similar to our *grouting*.

As this last method of building is not at present practised, that we know of, its expense comparatively with other modes cannot be stated, but it is extremely probable that it would be found cheaper than any other masonry, wherever building stones, or bricks were scarce and dear, if not in most other situations.

De Luc's electric Column.

Phil. Mag. V. 35, 317

The small bells connected to De Luc's electric column (mentioned in the last number) which were put up on the 14th of March have continued to ring from that day to the 23d, of April, when the account of them was forwarded, with the following intervals of rest: On the 24th of March they ceased to ring for about a minute, and again in the same